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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,462	07/07/2003	Tzu-Chiang Sung	252011-1490	7583

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EXAMINER

LANDAU, MATTHEW C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/614,462

Applicant(s)

SUNG ET AL.

Examiner

Matthew Landau

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7-13,15-19 and 21-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-13,15-19 and 21-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification lacks sufficient antecedent basis for “without a field oxide between the gate and the first and second wells” (claims 1 and 15), “without a field oxide between the gate and the first P and N wells” (claims 9 and 23), and “without a field oxide between the gate and the second P and N wells” (claims 9 and 23).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5, 7-13, 15-19, and 21-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Regarding claim 1, the limitation “without a field oxide between the gate and the first and second wells” is not fully supported by the originally filed specification. Although Figures 4 and 5 appear to disclose no field oxide between a gate and first and second wells, these drawings are merely isolated cross-sections that do not fully represent the device. In reality, both the gate and the well regions extend into and out of the page. Therefore, it is possible to have a

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Claims 1-5, 6-13, 15-19, and 21-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Regarding claim 1, the limitation “without a field oxide between the gate and the first and second wells” is not fully supported by the originally filed specification. Although Figures 4 and 5 appear to disclose no field oxide between a gate and first and second wells, these drawings are merely isolated cross-sections that do not fully represent the device. In reality, both the gate and the well regions extend into and out of the page. Therefore, it is possible to have a

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field oxide between the gate and the well regions at another location in the device not shown by the figures. Since the specification does not specifically mention the above limitation, and the drawings do not illustrate the device in a manner that would sufficiently rule out the possibility of having a field oxide between the gate and the wells, the newly added limitation constitutes new matter. Note that claims 9, 15, and 23 have similar problems.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 15, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Shirai (US Pat. 6,307,224).

Regarding claim 1, Figure 4A of Shirai discloses a high voltage device comprising a substrate 13 of a first type (n-type); first and second wells (22 and 27) respectively of the first type and a second type (p-type) in the substrate; a gate 25/26 formed on a junction between the first and second wells, without a field oxide between the gate and the first and second wells; first and second doped regions (24 and 29, respectively) both of the second type, respectively formed in the first and second wells and both sides of the gate; and a third doped region 23 of the first type in the first well and adjacent to the first doped region. In regards to claim 15, the device of Shirai must be made by the claimed method.

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Regarding claims 5 and 19, Figure 4A of Shirai discloses there is a spacing of the second doped 29 region to the gate 26/25.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Ito et al. (US Pat. 5,856,695, hereinafter Ito).

Regarding claims 2 and 16, the difference between Shirai and the claimed invention is field oxides isolating the high voltage device from other devices on the substrate. Figure 7 of Ito discloses field oxide regions 610/620 isolating a high voltage device from other devices (digital CMOS) on the substrate. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Shirai by including other devices (such as low voltage devices) on the same substrate with field oxide regions isolating the different types of devices. The ordinary artisan would have been motivated to modify Shirai in the manner described above for the purpose of increasing integration density while maintaining adequate isolation between different components.

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Claims 3, 4, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of McElheny et al. (US Pat. 6,740,944, hereinafter McElheny).

Regarding claims 3, 4, 17, and 18, Figure 4A of Shirai discloses the gate 25/26 comprises a gate oxide 25 on the substrate 13, and a conducting layer 26 on the gate oxide. The difference between Shirai and the claimed invention is spacers on two sides of the gate oxide and conducting layer, and a fourth lightly doped region of the second type adjacent to the first doped region and beneath one of the spacers. Figure 1B of McElheny discloses a MOSFET with sidewall spacers and light doped regions beneath the spacers (LDD structure). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Shirai by including sidewall spacers and a fourth lightly doped region (LDD structure). The ordinary artisan would have been motivated to modify Shirai in the manner described above for the purpose of further isolating the gate to prevent build-up of device capacitance (col. 1, lines 44-47 of McElheny) and further suppressing hot carrier generation, which is well known in the art.

Claims 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai.

Regarding claims 7 and 21, Shirai does not specifically disclose the first and second types are respectively P and N types. However, it is very well known in the art that conductivity types can be reversed. In fact, Shirai discloses that conductivity types are not limited to those mentioned in the embodiments (col. 12, lines 27-31). Therefore, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Shirai by reversing the conductivity types, thereby making the first type p-type and the second type n-type.

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Claims 8 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Liu et al. (US Pat 6,265,752, hereinafter Liu).

Regarding claims 8 and 22, Figure 4A of Shirai discloses the first and second types are respectively N and P types. The difference between Shirai and the claimed invention is a N+ buried layer in the substrate and beneath the first and second wells. Figure 5 of Liu discloses a N+ buried layer 22 beneath N and P wells. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Shirai by including a N+ buried layer for the purpose of eliminating the impact of body effect on threshold voltage (col. 3, lines 10-13).

Response to Arguments

Applicant's arguments with respect to claims 1-5, 7-13, 15-19, and 21-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

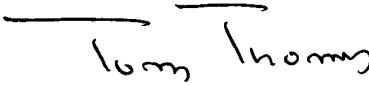
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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


TOM THOMAS
SUPERVISORY PATENT EXAMINER

Matthew C. Landau

Examiner

February 14, 2005